We claim:

1. A method for evaluating performance of an emission control device coupled in an exhaust system of a vehicle driven on the road, the method comprising:

determining a first factor based on a duration during which the emission control device is exposed to a lean air-fuel ratio above a limit value, said limit value determined as a function of temperature in the exhaust system;

determining a second factor based on an amount of sulfur contamination of said emission control device; and

determining a performance value for said emission control device based on said first and second factors.

2. The method recited in Claim 1 wherein said second factor is based on an estimated amount of sulfur retained in said emission control device.

3. The method recited in Claim 1 wherein said second factor is based on duration of vehicle operation.

4. The method recited in Claim 1 wherein said temperature is temperature of the emission control device.

5. The method recited in Claim 1 wherein said first factor is further based on a duration of time the emission control device is exposed to said lean air-fuel ratio above said limit value.

6. The method recited in Claim 1 wherein said first factor is further based on a duration of engine revolutions the emission control device is exposed to said lean air-fuel ratio above said limit value.

7. The method recited in Claim 1 wherein said first factor is further based on a duration of vehicle miles driven during which the emission control device is exposed to said lean air-fuel ratio above said limit value.

8. The method recited in Claim 1 wherein said performance value is a storage capacity.

9. The method recited in Claim 1 wherein said first factor determines degradation due to platinum growth in said emission control device.

10. A method for evaluating performance of an emission control device coupled in an exhaust system of a vehicle driven on the road, the method comprising:

determining a first factor based on a duration during which the emission control device is exposed to an exhaust gas mixture with an oxygen partial pressure above a limit value, said limit value determined as a function of temperature in the exhaust system;

determining a second factor based on an amount of sulfur contamination of said emission control device; and

determining a performance value for said emission control device based on said first and second factors.

11. The method recited in Claim 10 wherein said second factor is based on an estimated amount of sulfur retained in said emission control device.

12. The method recited in Claim 10 wherein said second factor is based on duration of vehicle operation.

13. The method recited in Claim 10 wherein said temperature is temperature of the emission control device.

14. The method recited in Claim 10 wherein said first factor is further based on a duration of time the emission control device is exposed to said lean air-fuel ratio above said limit value.

15. The method recited in Claim 10 wherein said first factor is further based on a duration of engine revolutions the emission control device is exposed to said lean air-fuel ratio above said limit value.

16. The method recited in Claim 1 wherein said first factor is further based on a duration of vehicle miles driven during which the emission control device is exposed to said lean air-fuel ratio above said limit value.

17. The method recited in Claim 10 wherein said performance value is a storage capacity.

18. The method recited in Claim 10 wherein said first factor determines degradation due to platinum growth in said emission control device.

19. The method recited in Claim 10 further comprising adjusting a rich purge air-fuel ratio based on said performance value.

20. The method recited in Claim 10 further comprising initiating and terminating a desulfurization process based on said performance value.

21. The method recited in Claim 10 further comprising adjusting a NOx capacity threshold based on said performance value, where said NOx capacity threshold is used to terminate lean operation and transition to rich operation.

22. The method recited in Claim 10 further comprising disabling lean operation based on said performance value.

23. The method recited in Claim 10 further comprising indicating degradation of said device based on said performance value.

24. An article of manufacture have a computer readable storage medium with computer readable code for evaluating performance of an emission control device coupled in an exhaust system of a vehicle driven on the road, the medium comprising:

code for determining a first factor based on a duration of time during which the emission control device is exposed to a lean air-fuel ratio above a limit value, said limit value determined as a function of temperature of exhaust gasses in the emission control device;

code for determining a second factor based on an amount of sulfur contamination of said emission control device, said second factor based on an estimated amount of sulfur contamination determined from engine operating conditions; and

code for determining a performance value for said emission control device based on said first and second factors, said performance value indicative of capacity of said emission control device to retain NOx during oxygen deficient exhaust gas conditions.

25. The article recited in Claim 24 further comprising code for adjusting lean engine duration based on said performance value.